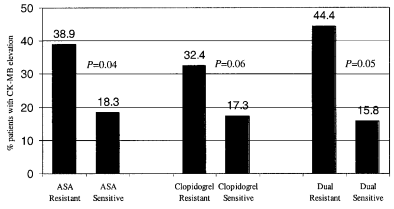
Inside This Issue of JACC

JANUARY 3, 2006, VOLUME 47, NO. 1

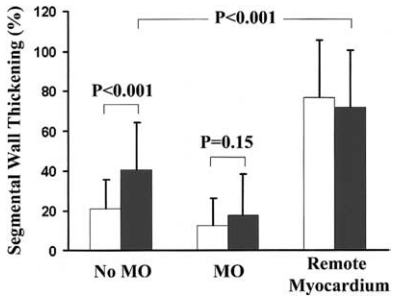


Page 31

Interventional Cardiology

Dual Drug Resistance to Aspirin and Clopidogrel

The etiology of aspirin resistance is not known and is likely multifactorial. If it is caused by a defect in a final common pathway of platelet activation, patients may also be resistant to clopidogrel. Lev and colleagues assayed several different measures of platelet activity in response to clopidogrel in patients taking aspirin. Using their criteria, 13% were resistant to aspirin and 24% to clopidogrel; more importantly, half of those resistant to aspirin were also resistant to clopidogrel. Both aspirin and clopidogrel resistant patients were about twice as likely to have creatine kinase-MB elevations after elective percutaneous coronary intervention than sensitive patients; those resistant to both were three times as likely. Aspirin and clopidogrel resistance are both common; a high percentage of patients may be resistant to both medications and at much greater risk for adverse cardiovascular outcomes. **See page 27. See figure.**



Page 43

Myocardial Infarction

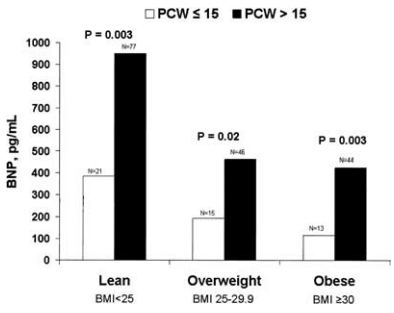
MRI Quantifies Infarct Healing After Primary Angioplasty

The time frame for and extent of myocardial recovery after apparently successful treatment for acute myocardial infarction (MI) has not previously been studied with magnetic resonance imaging (MRI). Baks and colleagues performed MRIs on patients who presented with ST-segment elevation MI and were successfully reperfused with emergent angioplasty within 6 h of symptom onset. The MRIs were performed five days after presentation and then repeated five months later. They quantified microvascular perfusion, wall thickness, and infarct size (area of delayed enhancement). Infarct size shrank by about one-third over the five months. In segments with normal microvascular perfusion, the wall thickness was increased at five days, suggesting either edema or hyperemia, and wall motion recovered after five months. Segments with poor microvascular perfusion at five days demonstrated wall thinning at five months and no recovery in wall motion. This study and this technique will be useful in evaluating new therapies that seek to improve functional recovery after acute MI. **See page 40. See figure.**

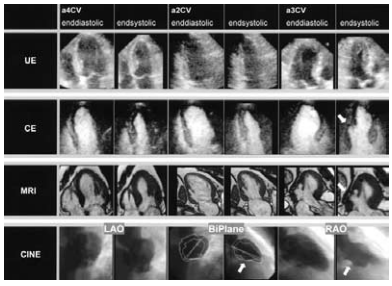
Metabolic Syndrome

Metabolic Syndrome Leads to Accelerated Arterial Stiffness

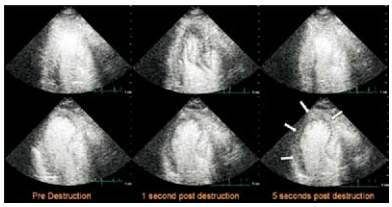
Arterial stiffness can be assayed by measuring the systolic blood pressure, the pulse pressure, or the pulse wave velocity (PWV) of blood flow in the central arteries. Stiff arteries have less elasticity and thus more of the force of ejection is converted into blood movement and less to arterial expansion. In this study, Safar and colleagues measured PWV in subjects with a range of cardiovascular risk factors at baseline and then six years later. Patients with no cardiovascular risk factors had no change in PWV, but subjects with three or more risk factors (patients with the metabolic syndrome) had clear evidence of arterial stiffening over this time frame. This study confirms that the metabolic syndrome is a diffuse process that leads to widespread maladaptive changes in the arterial tree. **See page 72.**



Page 88



Page 124



Page 143

Heart Failure

BNP Levels Lower in Obese Patients With Heart Failure

Recent reports have suggested that B-type natriuretic peptide (BNP) levels may be relatively lower in obese than non-obese subjects. This has important implications as BNP has become widely used both to assay for the presence or absence of heart failure and its severity. Horwich and colleagues compared BNP levels in over 300 patients with systolic heart failure (left ventricular ejection fraction <40%) stratified by body mass index . They report two significant findings. Firstly, for unknown reasons, BNP levels are lower in obese patients compared to non-obese patients with similar hemodynamics. The second important finding is that even in obese patients, elevated BNP remains a significant predictor of adverse outcomes, but different cut-off values should be used. **See page 85. See figure.**

Cardiac Imaging

Comparing Imaging Modalities to Identify Wall Motion Abnormalities

Identifying regional wall motion abnormalities (RWMA) has important prognostic implications, but most methods rely on qualitative interpretations rather than quantitative assessments. This study by Hoffmann and colleagues sought to compare interobserver and intermethod accuracy of RWMA determinations using cineventriculography, cardiac magnetic resonance imaging, unenhanced and contrast-enhanced echocardiography. They found only moderate interobserver agreement (IOA) for all methods. Contrast was found to substantially improve IOA for echocardiography; contrast echocardiography had the best correlation with clinical history. Magnetic resonance imaging was found to be subject to over- or under-reading with poor IOA for RWMA despite clear endocardial borders. Defining RWMA requires both interpretable images and experience correlating images with anatomy; quantitative methods may be required in the future to improve IOA. **See page 121. See figure.**

Cardiac Ultrasound

Myocardial Contrast Echocardiography Similar to SPECT for CAD Detection

Visualizing myocardial perfusion with real time ultrasound has been technically challenging. New ultrasound contrast agents and standardized protocols are now increasing its feasibility. Jeetley and colleagues compared the sensitivity and specificity of myocardial contrast echocardiography (MCE) with single-photon emission computed tomography (SPECT) for the detection of coronary artery disease (CAD) in patients with intermediate to high likelihood of CAD. Coronary angiography was performed as the gold standard. Subjects received dipyridamole as a vasodilator; they were then injected with sestamibi (to be imaged 60 min later) and infused with myocardial contrast bubbles which were immediately imaged with apical windows. Perfusion was assessed by destroying the myocardial bubbles and qualitatively timing the re-appearance of myocardial bubbles. The overall sensitivity for MCE was 84% and for SPECT was 82% with similar specificity. Myocardial contrast echocardiography may now be as reliable as SPECT for assessing cardiovascular perfusion and subsequent risk. **See page 141. See figure.**